

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

## NOTES: Section 4.8 – Use the Quadratic Formula and the Discriminant

- Goals: #1 - I can use the quadratic formula to solve a quadratic equation. 😎 😬 😓
- #2 - I can find the discriminant of a quadratic equation and use it to find the number and type of solutions.

### *Homework: Lesson 4.8 Worksheet*

#### Warm Up:

Solve the equation by completing the square.

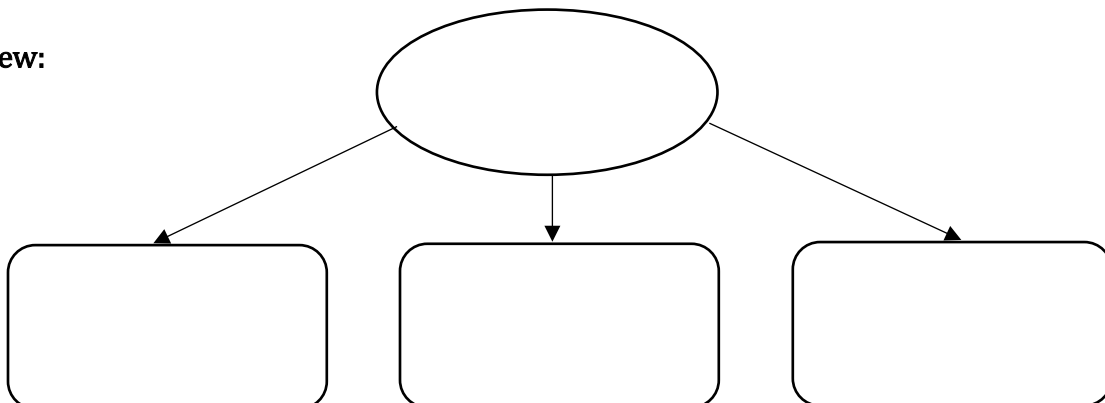
1.  $x^2 - 14x + 9 = 0$

2.  $3x^2 - 24x = -48$

Write the following quadratic function in vertex form. Then identify the vertex.

3.  $y = 3x^2 + 24x + 40$

#### Review:



Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

**Notes:**

We can find the solutions to \_\_\_\_\_ quadratic \_\_\_\_\_ by using the \_\_\_\_\_:

This formula can be derived from \_\_\_\_\_.

**Example #1:** Use the quadratic formula to solve the equation.

1.  $x^2 + 3x = 2$

2.  $25x^2 - 18x = 12x - 9$

3.  $-x^2 + 4x = 5$

**You practice:** Use the quadratic formula to solve the equation.

1.  $4x^2 - 10x = 2x - 9$

2.  $7x - 5x^2 - 4 = 2x + 3$

**CHALLENGE:** What do you notice about the value the radical symbol in the last 5 examples?

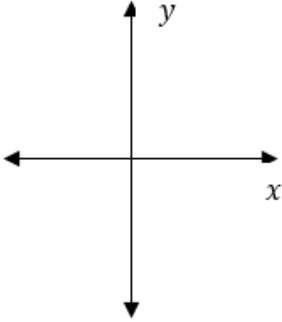
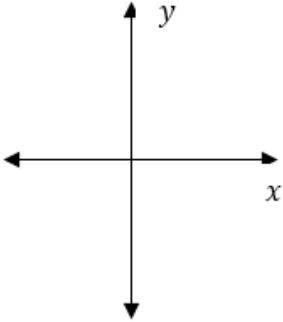
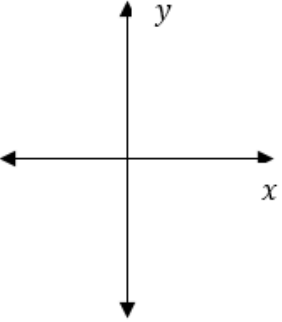
Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

**Notes:**

In the quadratic formula, the expression \_\_\_\_\_ is called the \_\_\_\_\_ of the quadratic equation \_\_\_\_\_.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

We can use the \_\_\_\_\_ of a quadratic equation to determine the equation's \_\_\_\_\_ and \_\_\_\_\_ of \_\_\_\_\_.

Value of discriminant			
Number and type of solutions			
Graph of $y = ax^2 + bx + c$			

**Example #2:** Find the discriminant of the quadratic equation and give the number and types of solutions of the equation.

1.  $x^2 - 8x + 17 = 0$

2.  $2x^2 = 16x - 32$

3.  $x^2 - 8x + 15 = 0$

Name: \_\_\_\_\_ Hour: \_\_\_\_\_ Date: \_\_\_\_\_

**You practice:** Find the discriminant of the quadratic equation and give the number and types of solutions of the equation.

1.  $3x^2 + 12x + 12 = 0$

2.  $8x^2 = 9x - 11$

3.  $7x^2 - 2x = 5$

**Notes:**

In Section 4.5, the function  $h = -16t^2 + h_0$  was used to model the height of a \_\_\_\_\_ object. For an object that is \_\_\_\_\_ or \_\_\_\_\_, an extra term \_\_\_\_\_ must be added to the model to account for the object's \_\_\_\_\_.

- Object is *dropped*.
- Objected is *launched or thrown*.

The value of \_\_\_\_ can be \_\_\_\_\_, \_\_\_\_\_, or \_\_\_\_\_ depending on whether the object is launched \_\_\_\_\_, \_\_\_\_\_, or \_\_\_\_\_ to the ground.

**Example #3:** A juggler tosses a ball into the air. The ball leaves the juggler's hand 4 feet above the ground and has an initial vertical velocity of 40 feet per second. The juggler catches the ball when it falls back to the height of 3 feet. How long is the ball in the air?